

Recommendations for a National Levee Safety Program



A Report to Congress from the National Committee on Levee Safety



An Involved Public and Reliable Levee Systems

About our nation's levees

California's State Engineer, William Hammond Hall, reportedly stated:

"...There are two kinds of levees, those that have failed and those that will fail."



An Involved Public and Reliable Levee Systems

2

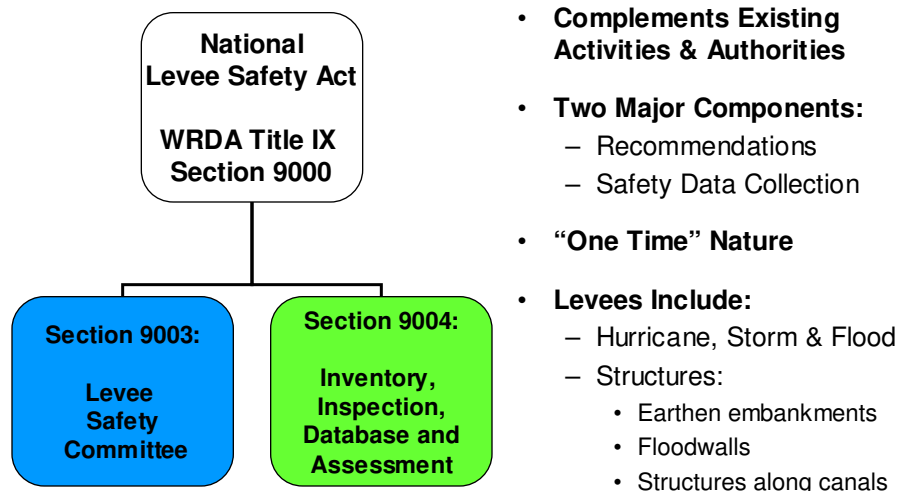
Presentation Overview

- The Levee Safety Act of 2007
- National Committee on Levee Safety
- Stating the problem
- Recommendations
 - Leadership via a National Commission on Levee Safety
 - Strong Safety Programs in All States
 - Aligned Federal Programs
- Investing in a National Levee Safety Program
- Next Steps and Closing

An Involved Public and Reliable Levee Systems

3

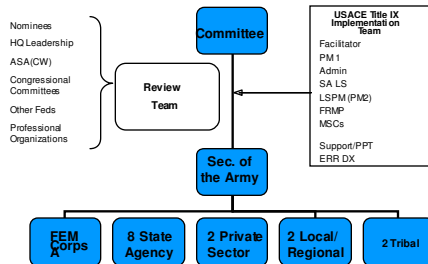
National Levee Safety Act



An Involved Public and Reliable Levee Systems

4

National Committee on Levee Safety Section 9003



Mission Statement –

from Title IX of WRDA 2007

“The committee shall develop recommendations for a National Levee Safety Program, including a strategic plan for implementation of the program.”

- Committee - Multidiscipline in nature: Engineering, Law, Public Administration, Business, etc.
- Supported by USACE and FEMA, but primarily non-federal composition
- Review Group – Multidiscipline in nature, including above and Budget, Environmental, Tribal, etc.

An Involved Public and Reliable Levee Systems

5

Vision and Approach

Vision for Levee Safety in the U.S.

“An involved public and reliable levee systems working as part of an integrated approach to protect people and property from floods”

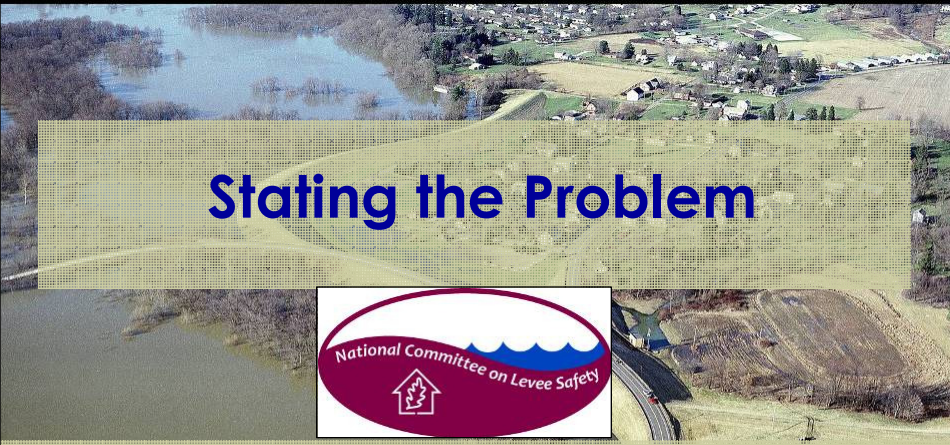


Approach – Focus on foundational elements in the Act supporting the vision, while distinguishing from broader issues of flood risk management

- Use of sound technical practices in levee design, construction, operation, inspection, assessment, security and maintenance
- Ensure effective public education and awareness of risks involving levees
- Establish and maintain competent levee safety programs and procedures that emphasize the protection of human life
- Implement feasible governance solutions and incentives that encourage and sustain strong levee safety programs at all levels of government, including hazard reductions and mitigation measures related to levees

An Involved Public and Reliable Levee Systems




6

Stating the Problem

An Involved Public and Reliable Levee Systems

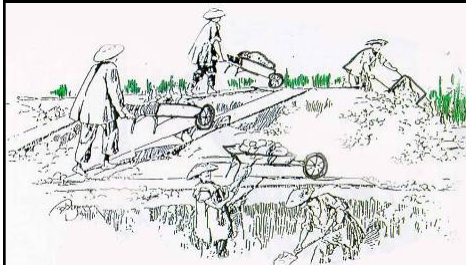
Levees – a long history (1600's – 1920's)

An Involved Public and Reliable Levee Systems

8

Levees – Early construction methods



- *Varied methods*
- *No common standards*
- *Not good levee records*
- *Buried their technology within them*

An Involved Public and Reliable Levee Systems

9

Unintended Consequences (1960's – present)

- ✓ 1968 Establishment of FEMA National Flood Insurance Program and selection of 100-year Flood Protection for Preferred Insurance Rates/ Development Limitations
- ✓ 1986 Water Resources Development Act Establishing Non-federal Cost Sharing for Federal Flood Control Projects
- ✓ Lack of Understanding about Flood Risks

***Led Communities and Public Agencies to
mostly seek only 100-year Flood Protection***

An Involved Public and Reliable Levee Systems

10

Complacency Regarding Levees



Missouri River, 1993

Unheeded wake-up calls:

- 1993 Midwest Floods
- 1997 Central California Valley



Wake-up call we cannot ignore:

- 2005 Katrina



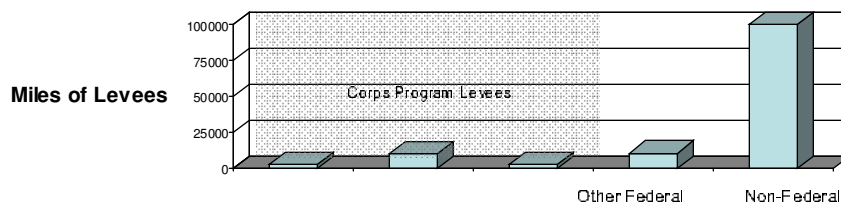




An Involved Public and Reliable Levee Systems

11

Our Current Situation



- ✓ **Levees are Abundant and Integral to Communities:**
 - Critical for the Protection of People, Property, and other Infrastructure
 - Estimated that tens of millions of people live and work in leveed areas
- ✓ **No National Standards, nor Approaches**
 - Designed for one purpose now serving another
 - Systems based approaches were most often not used, but are needed
- ✓ **Risk: A Dynamic that We Can Keep Up With?**
 - Average age of 50 years, Climate Change, Infrastructure Degradation, & Increasing Population Growth

An Involved Public and Reliable Levee Systems

12

Our Call to Action

- ✓ **Act Now to Address all Facets of Risk:**
 - *Likelihood of experiencing floods*
 - *Likelihood that levee infrastructure and other flood protection measures will perform as intended during these events*
 - *Consequences of poor performance or failure for the protected people, property and the environment*
- ✓ **If we don't act – a worsening disaster relief environment**
- ✓ **Securing a Better Future – A National Levee Safety Program**

An Involved Public and Reliable Levee Systems

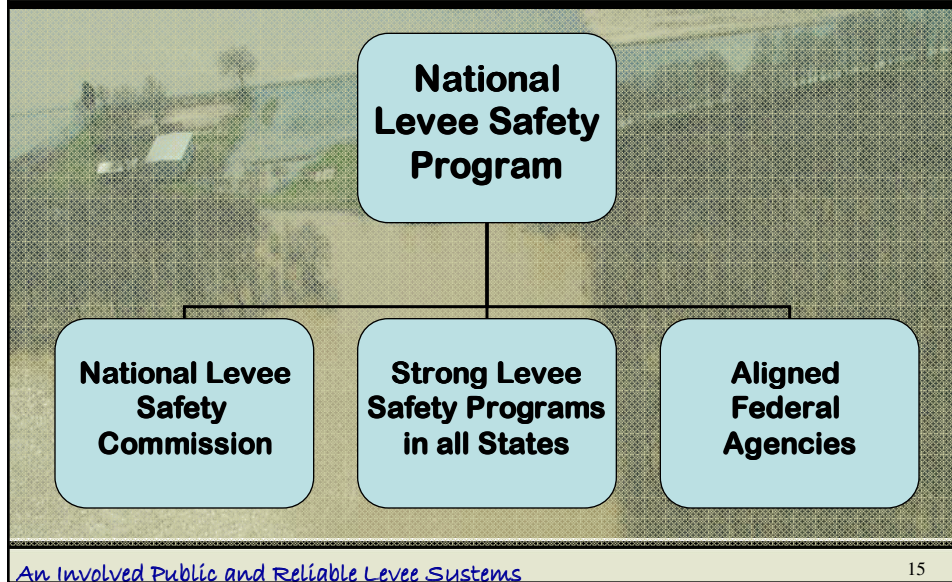
13

Other Considerations

- **The National Committee on Levee Safety considered a number of recommendations as important, but outside the scope of the Levee Safety Act:**
 - Need for a Comprehensive National Flood Risk Management Program
 - Opportunity to integrate recommendations with the National Dam Safety Program
 - A priority for levees within the emerging National Infrastructure Dialogue

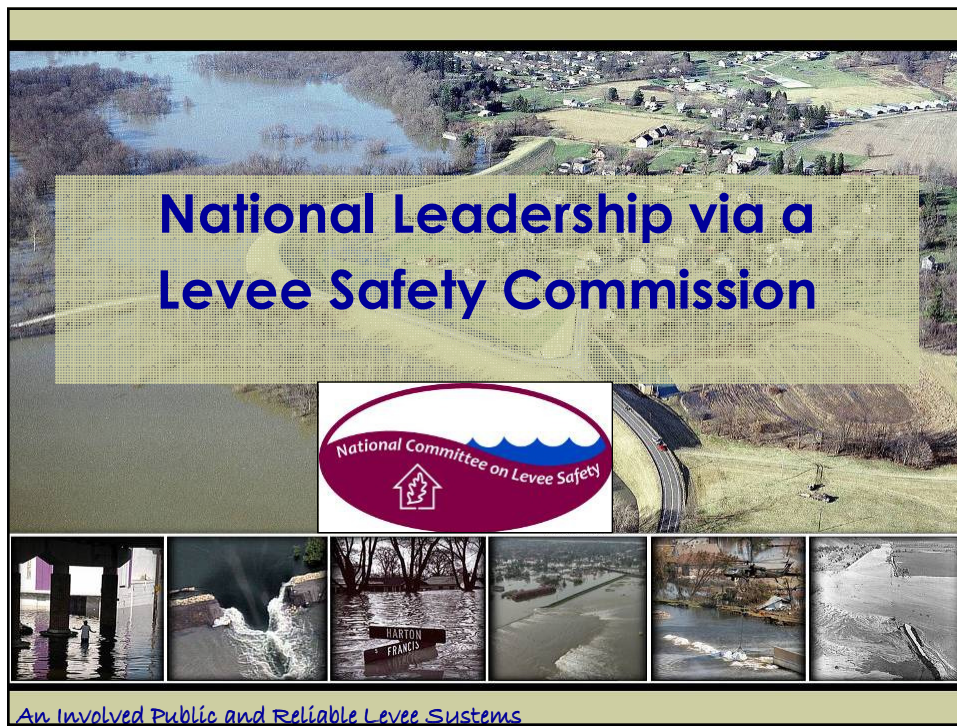
14

Major Recommendations



15

Recommendations on a National Levee Safety Program	Implementation Phase of Work
Comprehensive and Consistent National Leadership <ol style="list-style-type: none"> 1. Establish a National Levee Safety Commission 2. Expand and Maintain the National Levee Database 3. Adopt a Hazard Potential Classification System 4. Develop & Adopt National Levee Safety Standards 5. Develop Tolerable Risk Guidelines 6. Change "Certification" to "Compliance Determination" 7. Require Peer Review of Levee Compliance Determinations 8. Swiftly Address Emerging Levee Liability Issues 9. Develop & Implement a Public Involvement and Education/Awareness Campaign 10. Provide Technical Materials and Technical Assistance 11. Develop a National Levee Safety Training Program 12. Harmonize Safety and Environmental Concerns 13. Conduct a Research & Development Program 	Phase I Phase I Phase I Phase II Phase II and III Phase I Phase I Phase I Phase I and II Phase II Phase II Phase II Phase II
Building and Sustaining Levee Safety Program in All States <ol style="list-style-type: none"> 14. Design and Delegate Program Responsibilities to States 15. Establish a Levee Safety Grant Program 16. Establish the National Levee Rehabilitation, Improvement, and Flood Mitigation Fund 	Phase II Phase II Phase II
Aligning Existing Federal Programs <ol style="list-style-type: none"> 17. Explore potential incentives and disincentives for good levee behavior 18. Mandate Purchase of Risk-Based Flood Insurance in Leveed Areas 19. Augment FEMA's Mapping Program 20. Align FEMA's Community Rating System to Reward Safety Programs that Exceed Requirements 	Phase II Phase I Phase I Phase I



1. Establish a National Levee Safety Commission

- Effective governance of the Program
 - Independence
 - Leadership
 - Organizational capabilities
 - Experience
- Organizational Structure
 - New agency with functional/operational responsibility for NLSP
 - Consists of Decisional Commission and Commission Staff
- Standing Advisory Committees
 - Delegated Programs
 - Technical
 - Public Involvement, Education/Awareness
 - Environment & Safety

An Involved Public and Reliable Levee Systems

18

NLSP Governance Structure



Responsibilities of the Commission

- Administer the National Levee Safety Program and evaluate the overall program effectiveness.
- Provide oversight of delegated programs and incentives/disincentives
- Expand and maintain the National Levee Database
- Develop:
 - Hazard classification system and definitions
 - National Levee Safety Standards
 - Tolerable Risk Guidelines
- Conduct Research and Development
- Provide Technical Materials, Assistance and Training
- Lead Public Involvement and Education/Awareness Campaign
- Harmonize levee safety activities with environmental protection requirements and principles
- Provide for inventory and inspections where no state delegation exists

An Involved Public and Reliable Levee Systems

20

Concurrent Responsibilities of Others

- **Federal Agencies**
 - Adopt or exceed established levee safety standards
- **States/Local/Regional Governments**
 - Set up delegated program
 - Adopt or exceed established levee safety standards
 - Update inventory and inspection
 - Reporting
- **Owner/Operators**
 - Perform Operation & Maintenance
 - Assist in local communication, risk education
 - Flood fighting
 - Repair, Rehabilitation, Replacement, Removal

An Involved Public and Reliable Levee Systems

21

2. Expand and Maintain the National Levee Database

- Current State: an uncertain number, an uncertain condition
- Develop a comprehensive national inventory of levees
- Corps to expand current (Sec. 9004) inventory to:
 - include all levees nationwide,
 - perform one-time inspection of inventoried levees, and
 - with 100% Federal funding.
- Maintain a comprehensive national levee database
- Corps to expand current levee database to include performance data and additional levees identified in inventory

An Involved Public and Reliable Levee Systems

22

3. Adopt Hazard Potential Classifications

Hazard Potential Classification	Number of People Potentially Inundated	Number of People Potentially Inundated to Depths ≥ 3 feet
High	$\geq 10,000^*$	$\geq 10,000^*$
Significant	$> 1,000^{**}$	$< 10,000^{**}$
Low	$< 1,000$	0

* Also includes areas of consequence where critical life safety infrastructure is at risk (e.g. major hospitals, regional water treatment plants, and major power plants)

** Also includes areas of consequence where the number of people potentially inundated is low, but there may be significant potential for large economic impacts or losses

An Involved Public and Reliable Levee Systems

23

4. Develop a Common Set of Standards for Levee Safety

- **4a. Definitions**
 - Inclusions:
 - Levees & Floodwalls
 - Structures along Canals
 - Structures that Act as Part of Levee Systems
 - Levee Features, Segments, & Systems
 - Exemptions
 - Certain federal systems
 - Natural Ground
 - Non-flood structures
 - Size Exclusions
- **4b. Standards**
 - Interim National Levee Engineering Procedures within first year
 - National Levee Safety Code of Engineering Standards within 5 years

An Involved Public and Reliable Levee Systems

24

5. Develop Tolerable Risk Guidelines

- **Develop and adopt National Tolerable Risk Guidelines in order to:**
 - Evaluate Options to Reduce Risk
 - Structural
 - Non-Structural
 - Understand Uncertainty
 - Make more Compelling, Justified Investments
 - Better Communicate Risks

An Involved Public and Reliable Levee Systems

25

6. Replace Certification Term

- **Use “Compliance Determination” in lieu of “Certification” Term:**
 - “Certification” implies there may be a warranty and liability insurers have reacted to this implication via constraints and higher insurance rates
 - “Compliance Determination” more accurately reflects the nature of the levee evaluations and decisions regarding inclusion in the National Flood Insurance Program

26

7. Implement Peer Review of Levee Compliance Determinations

- **Subject all Compliance Determinations (“Certifications”) in FEMA’s National Flood Insurance Program to Independent Peer Review:**
 - Increases Confidence in Technical Evaluations
 - Assures Adherence to National Standard

27

8. Address the Liability Issue

- **Issue: Parties potentially subject to liability**
 - Engineering service providers, both private sector and public entities
 - State and local governments may be liable as a sponsor of federal flood control project
 - New liability could be acquired by states and local agencies from implementing Levee Safety Programs
- **Effect:** Willingness to provide levee-related services has been and will be substantially impaired
- **Recommended Action:** Congress should swiftly address growing concerns regarding liability through a range of measures aimed at reducing potential liability for those providing levee related services.

An Involved Public and Reliable Levee Systems

28

9. Lead Public Involvement and Education/Awareness Campaign

- **Requirements:**
 - Assess needs and gather public input
 - Ensure consistency of message and terminology
 - Provide opportunities to educate public
 - Ensure risk is communicated consistently and clearly
 - Seek to change behavior
 - Enlist proper expertise for program development
 - Develop strategies at the National Level
- **Actions:**
 - Interim: FEMA Leads a Coordinating Council on Communication
 - Long Term: Establish a standing advisory committee to National Levee Safety Commission

An Involved Public and Reliable Levee Systems

29

10. Provide Comprehensive Technical Materials and Assistance

- **Technical Materials that support adoption of a National Levee Safety Code:**
 - Federal Agency Led
 - Publications on design, construction, operations, maintenance, and safety processes
- **Technical Assistance to Federal, State, Local and Regional Agencies from the National Commission on Levee Safety:**
 - Understanding and implementing safety programs
 - Implementing standards and codes
 - Using technical assistance materials

An Involved Public and Reliable Levee Systems

30

11. Develop a National Levee Safety Training Program

- **A multi-faceted Program, Coordinated with National Standards and Technical Materials:**
 - A specific curriculum, successful completion to result in graduate designation as a “***Certified Levee Professional***”
 - National and local, self-paced training opportunities
 - Annual National Levee Safety Conference sponsored jointly by pertinent federal agencies and national flood management professional organizations (e.g. ASDSO, USSD, NAFSMA, ASFPM)

31

12. Harmonize Environmental and Safety Concerns

- **Establish an Interdisciplinary Standing Advisory Committee to the National Commission that would Collaborate and Coordinate Issues:**
 - Direct Research and Development efforts in relation to compatibility of Operations & Maintenance Practices with environment
 - Work toward national solutions to environmental and public safety challenges and decisions
 - Work with designated environmental liaisons within State Levee Safety Programs

An Involved Public and Reliable Levee Systems

32

13. Research & Development

- **Through the Technical Standing Advisory Committee of the National Commission, advance state-of-the art practices:**
 - Innovative technology for repairs/improved engineering methods
 - Technical and archival research
 - Dissemination of research products
 - Technology and tools to enhance security of levees at the operation level
 - Forensic investigations for levee failures and/or severe distress

33



14. Delegate State Safety Programs

- **Design and Delegate Program Responsibilities to States to assist State and Local Governments in developing Levee Safety Programs:**
 - Primary NLSP implementation for non-Federal levees is through State programs
 - Delegation is qualifications based in demonstrating the authority, regulation, and resources to perform basic functions:
 - Adopt National Standards
 - Inspection and Inventory Participation
 - Public Education and Awareness
 - Coordinate National, State, and Local Program Activities
 - Emergency Action and Evacuation Plan
 - Other Programs and Procedures for Hazard Reduction and Mitigation Relating to Levees

35

15. Levee Safety Grant Program

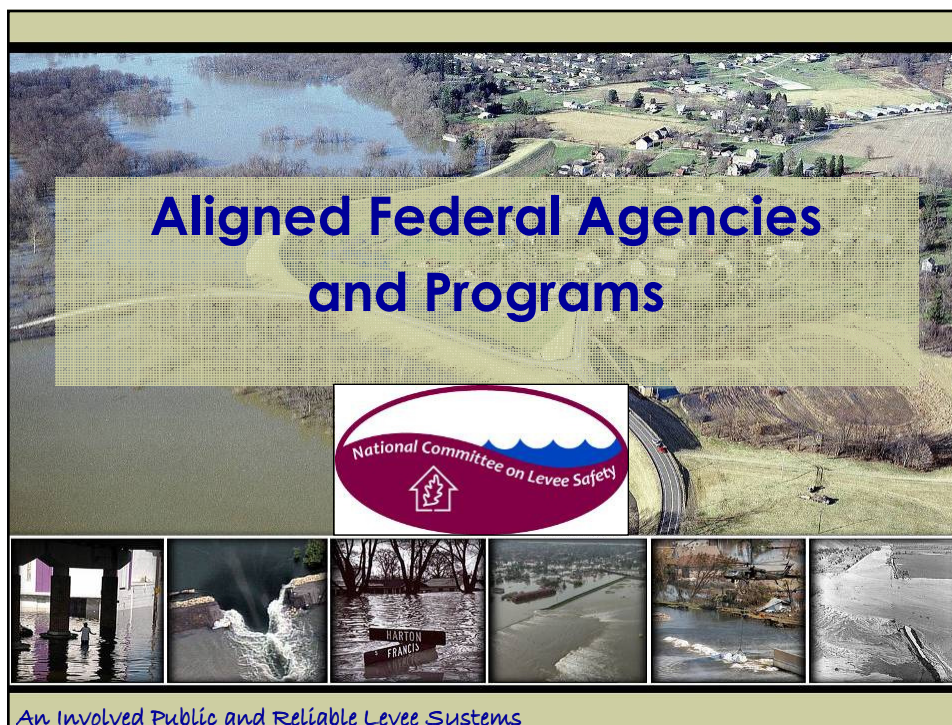
- **Assist states and local governments in developing and maintaining institutional capacity, expertise, and program framework:**
 - Authorize and appropriate sufficient funds to establish new Grants program funded through the Commission in a phased and cost shared approach:
 - Phase II Stand-Up: 75% federal, 25% non-federal
 - Phase III Steady State: 50% federal, 50% non-federal
 - Additional funding provided to states to distribute to multi-jurisdictional or levee system specific programs
 - Initially administered by FEMA, then the Commission

36

16. National Levee Rehabilitation, Improvement, & Mitigation Fund

- **To Aid State and Locals in rehabilitation, improvement, or removal of deficient levees:**
 - Focused Initially on high risk urban areas
 - Cost Shared Investment: 65% federal, 35% local
 - Work Includes structural and non-structural solutions based upon maximizing overall public safety risk reduction
 - Requirements for Eligibility:
 - National Levee Database Participation
 - Demonstrate Financial Means
 - Participate in National Flood Insurance Program
 - Risk Communication and Emergency Response Plan

37



17. Explore Incentives/Disincentives

- **Promote good practices and behavior by alignment of existing federal programs through:**
 - Savings/funding to communities, eligibility for federal funding, priority for federal funding, and cost sharing requirements
 - Exclude emergency related programs/funds
 - Potential Programs:
 - FEMA Disaster Assistance Funds such as Individual Assistance, Public Assistance, and Mitigation Grants
 - Corps Programs such as PL84-99, new projects, and Section 216
 - Other Federal Programs such as Highway funds, HUD Grants, SBA loans for other than disaster recovery, and federal loan guarantees
 - Proposals intended to be revenue neutral, encouraging investment in safe areas, discouraging in risky areas

39

18. Mandatory Risk-Based Insurance

- **Phased approach to requirement for mandatory, residual risk-based insurance rates behind levees:**
 - Purpose:
 - Reduce Financial Damages
 - Increase Understanding of Flood Risks
 - Requires legislation
 - Implemented via FEMA Risk Map Program

40

19. Augment FEMA's Mapping Program

- **To improve risk identification and communication in leveed areas:**
 - Identify levee systems and associated consequence failure zones
 - Re-designate existing Zone A/AE or X areas as either AL or XL respectively if in leveed area
 - Depict on FEMA web-site additional flood hazard information that may be provided by state and local entities

41

20. Align CRS to Reward Safety Programs

- **Revise FEMA's Community Rating System Program to credit communities that exceed Levee Safety Program requirements.**
- **Purpose:**
 - Further Incentivize Superior performance in it's State Levee Safety Program
 - Reduce Flood Insurance Premiums for individuals in communities with strong levee safety programs

42

What Comes Next: Looking to the Future of a National Levee Safety Program










16 December 2008

An Involved Public and Reliable Levee System

Strategic Implementation of Recommendations

Immediate Actions		Short Term Actions					Long Term Actions				
Calendar Years											
2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
"Immediate Actions" Existing & New Authorities		"Standing Up the Program" Primarily Incentives Requires Legislation					"Sustaining the Program" Incentives and Disincentives				

An Involved Public and Reliable Levee Systems

44

Investing in a National Levee Safety Program

Major Recommended Elements of a National Levee Safety Program	Estimated Total Costs by Phase (millions)*	
	Phases I/II (years 1-5)	Phase III (steady state)
National Levee Safety Commission	\$40	\$41
State Levee Safety Grant Program	\$150*	\$150*
Complete Initial Inventory and Inspection	\$125	\$3*
Levee Rehab & Mitigation Fund	\$923*	\$1538*

• Benefits

- Public Safety Responsibility (exposure and losses dwarf that of dam safety)
- Economically Justified:
 - \$10B/year in flood damages prevented
 - +\$4B/year damages suffered
 - Post capital investment exposure remains high
 - Insurance (only) exposure of \$375B

*elements are cost shared

45

Anecdotes of Justification (extreme events that keep happening)

- **Great Flood of 1993**
 - Covered 400,000 square miles
 - 200 counties declared disaster areas
 - 72,000 homes destroyed
 - Losses and Costs exceeded \$20B
 - 47 Lives Lost
 - Lasted 200 days
- **Hurricane Katrina**
 - >\$200B in direct and indirect damages
 - 1,810 Lives Lost
- **2008 Midwest Flood:**
 - 40,000 evacuated
 - 24 lives lost
 - \$2.7B federal relief
- **2008 Hurricanes**
 - >3M evacuated

46

Closing

- **Not Just an Expense – It's an Investment**
 - New activities, new costs
 - Can we afford to live in a disaster relief environment?
- **Next Steps**
 - OMB Clearance of the Report
 - Report to Congress January 2009
 - Continued refinement, vetting, & data support
 - Expect broadening stakeholder and momentum building activities on national, regional scale